

CLAIMS

1. A method of securing a firearm having an action, said method comprising the steps of:

- a. selecting a location on the firearm at which to attach an integral locking device, wherein the location is selected such that:
 - i. when actuated, the locking device interferes with a portion of the firearm's action, preventing the firearm from being fired;
 - ii. the locking device can only be actuated when the firearm's action is in an open position; and
 - iii. to the extent the firearm can be operatively disassembled when the locking device is actuated, the locking device cannot be accessed and/or defeated internally; and
- b. attaching the locking device to the firearm at the selected location.

2. The method of Claim 1 wherein the locking device interferes with at least one of the following portions of the firearm's action: an action bar; a bolt; an elevator; a bolt slide; and/or a modified action slide tube adapter.

3. The method of Claim 1 wherein the locking device is a low-profile, key-actuated plunger lock attached to and extending through a receiver portion of the firearm.

4. The method of Claim 1 wherein:

- a. the locking device comprises:
 - i. a lock body attached to and extending through a receiver portion of the firearm, and said lock body having an axial bore;
 - ii. a lock plunger disposed in the axial bore and having a helical guide groove;
 - iii. a guide pin attached to the lock body, said guide pin having an end that lies within the helical guide groove; and
 - iv. a lock key configured to engage an end of the plunger accessible from the exterior of the firearm; wherein when the lock key is used to rotate the plunger, the helical guide groove of the plunger is

forced to track along the guide pin attached to the lock body, causing the plunger to extend or retract; and

5 b. the method further comprises the step of actuating the locking device by rotating the plunger with the lock key to cause the plunger to extend and interfere with a portion of the firearm's action.

10 5. The method of Claim 1 wherein the locking device is a low-profile, key-actuated plunger lock attached to and extending through a receiver portion of the firearm, said plunger lock being substantially flush with an external surface of the receiver, and said plunger lock having a thickness that is substantially the same as a thickness of the receiver.

15 6. The method of Claim 1 wherein the location on the firearm at which to attach the integral locking device is further selected such that when the locking device is actuated, a chamber portion of the firearm is visually exposed, thereby allowing a user to easily determine whether or not the chamber is empty.

15 7. A method of securing a firearm comprising the step of actuating an integral locking device attached to the firearm at a pre-selected location, wherein:

20 a. the actuated locking device restricts the movement of an action portion of the firearm, preventing the action from being closed and the firearm from being fired; and

20 b. the pre-selected location is chosen such that:
 i. the locking device can only be actuated when the firearm's action is in an open position; and
 ii. to the extent the firearm can be operatively disassembled when the locking device is actuated, the locking device cannot be accessed and/or defeated internally.

25 8. A method of securing a firearm having an action, said method comprising the steps of:

30 a. determining a first set of locations on the firearm where an integral locking device, when actuated, will interfere with the firearm's action;

30 b. determining a second set of locations on the firearm where the locking device can only be actuated when the action is open;

c. determining a first subset of locations comprising a union of the first and second sets of locations; and

d. attaching the locking device to the firearm at one of the locations in the first subset of locations.

5 9. The method of Claim 8 wherein:

a. the method further comprises the steps of:

i. determining a third set of locations on the firearm where the locking device cannot be accessed and/or defeated internally to the extent the firearm can be operatively disassembled when the locking device is actuated; and

10 ii. determining a second subset of locations comprising a union of the first subset of locations and the third set of locations; and

b. the locking device is attached to the firearm at one of the locations in the second subset of locations.

15 10. A method of securing a firearm having an action, said method comprising the steps of:

a. determining a first set of locations on the firearm where an integral locking device, when actuated, will interfere with the firearm's action;

20 b. determining a second set of locations on the firearm where the locking device can only be actuated when the action is open;

c. determining a third set of locations on the firearm where the locking device cannot be accessed and/or defeated internally to the extent the firearm can be operatively disassembled when the locking device is actuated;

25 d. determining a subset of locations comprising a union of the first, second, and third sets of locations; and

e. attaching the locking device to the firearm at one of the locations in the subset of locations.

30 11. A firearm comprising:
a. a receiver;
b. an action attached to the receiver; and
c. an integral lock means attached to the receiver for interfering with a portion of the action when actuated, thereby preventing the firearm from

being fired, wherein the lock means can only be actuated when the action is in an open position.

12. The firearm of Claim 11 wherein the lock means cannot be accessed and/or defeated internally to the extent the firearm can be operatively disassembled when the lock means is actuated.

13. A firearm comprising:

- a. a receiver;
- b. an action attached to the receiver; and
- c. an integral locking device attached to the receiver, wherein:

10 the locking device can be actuated to interfere with a portion of the action, thereby preventing the firearm from being fired; the locking device can only be actuated when the action is in an open position; and the locking device cannot be accessed and/or defeated internally to the extent the firearm can be operatively disassembled when the locking device is actuated.

15 14. The firearm of Claim 13 wherein the locking device interferes with at least one of the following portions of the firearm's action: an action bar; a bolt; an elevator; a bolt slide; and/or a modified action slide tube adapter.

15. The firearm of Claim 13 wherein the locking device is a plunger lock comprising:

20 a. a lock body attached to the receiver and having an axial bore;

b. a lock plunger disposed in the axial bore and having a helical guide groove;

c. a guide pin attached to the lock body, said guide pin having an end that lies within the helical guide groove; and

d. a lock key configured to engage an end of the plunger accessible from the exterior of the firearm; wherein when the lock key is used to rotate the plunger, the helical guide groove of the plunger is forced to track along the guide pin attached to the lock body, causing the plunger to extend or retract.

30 16. The firearm of Claim 13 wherein the locking device is a plunger lock comprising:

a. ✓ a lock body attached to the receiver and comprising: an outer face external to the firearm; an axial bore extending part way through the lock body; and an entry slot extending from the outer face through to the axial bore;

5 b. ✓ a lock key having a narrow neck and a U-shaped prong at the end of the neck, said lock key being dimensioned to fit through the lock body entry slot and into the lock body axial bore;

10 c. ✓ a lock end cap connected to the lock body within the lock body axial bore, said lock end cap having a longitudinal through-space comprising: an annular end space at a first end of the lock end cap; an axial central portion extending from the annular end space through to a second end of the lock cap; two opposed slots running along either side of the axial central portion; and two opposed, rounded recesses extending back from the annular end space and offset from the opposed slots;

15 d. ✓ a lock plunger disposed in the lock body axial bore and comprising: a plunger head having two opposed notches dimensioned to accommodate the U-shaped prong of the lock key; a plunger shaft connected to the plunger head and positioned within the axial central portion of the lock end cap longitudinal through-space; and a transverse bore extending through the plunger shaft;

20 e. ✓ a cross pin disposed in the plunger shaft transverse bore and having ends that extend past the transverse bore, said cross pin ends being dimensioned to fit within the two opposed slots and the annular end space of the lock end cap longitudinal through-space, and said cross pin ends being dimensioned to nestle in and lie between the two opposed, rounded recesses of the lock end cap longitudinal through-space; and

25 f. ✓ a spring positioned concentrically over the plunger shaft between the plunger head and the cross pin; wherein to actuate the plunger lock: the lock key is inserted through the lock body entry slot and into the lock body axial bore until the U-shaped prong engages the plunger head; the lock key and the plunger are pushed forwards against the pressure of the spring, with the cross pin, constrained laterally between the opposed slots, tracking along until the cross pin clears the opposed slots and lies within the annular end space; the lock key is

rotated, causing the lock plunger and cross pin to rotate, until the ends of the cross pin are aligned with the rounded recesses; and the lock key is retracted, allowing the spring to cause the ends of the cross pin to nestle in and lie between the two opposed, rounded recesses of the lock end cap longitudinal through-space, at which point an end of the plunger shaft opposite the plunger head lies extended past the lock body and lock end cap, so as to interfere with a portion of the firearm's action.

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17. An integral locking device for firearms comprising:

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a. a lock body comprising: an outer face; an axial bore extending part way through the lock body; and an entry slot extending from the outer face through to the axial bore;

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b. a lock key having a narrow neck and a U-shaped prong at the end of the neck, said lock key being dimensioned to fit through the lock body entry slot and into the lock body axial bore;

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c. a lock end cap connected to the lock body within the lock body axial bore, said lock end cap having a longitudinal through-space comprising: an annular end space at a first end of the lock end cap; an axial central portion extending from the annular end space through to a second end of the lock cap; two opposed slots running along either side of the axial central portion; and two opposed, rounded recesses extending back from the annular end space and offset from the opposed slots;

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d. a lock plunger disposed in the lock body axial bore and comprising: a plunger head having two opposed notches dimensioned to accommodate the U-shaped prong of the lock key; a plunger shaft connected to the plunger head and positioned within the axial central portion of the lock end cap longitudinal through-space; and a transverse bore extending through the plunger shaft;

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e. a cross pin disposed in the plunger shaft transverse bore and having ends that extend past the transverse bore, said cross pin ends being dimensioned to fit within the two opposed slots and the annular end space of the lock end cap longitudinal through-space, and said cross pin ends being

dimensioned to nestle in and lie between the two opposed, rounded recesses of the lock end cap longitudinal through-space; and

f. a spring positioned concentrically over the plunger shaft between the plunger head and the cross pin; wherein to actuate the plunger lock: the lock key is inserted through the lock body entry slot and into the lock body axial bore until the U-shaped prong engages the plunger head; the lock key and the plunger are pushed forwards against the pressure of the spring, with the cross pin, constrained laterally between the opposed slots, tracking along until the cross pin clears the opposed slots and lies within the annular end space; the lock key is rotated, causing the lock plunger and cross pin to rotate, until the ends of the cross pin are aligned with the rounded recesses; and the lock key is retracted, allowing the spring to cause the ends of the cross pin to nestle in and lie between the two opposed, rounded recesses of the lock end cap longitudinal through-space, at which point an end of the plunger shaft opposite the plunger head lies extended past the lock body and lock end cap.

18. An integral locking device for firearms comprising:

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a. a lock body having: an axial through-bore; a fore end that lies exposed to the exterior of a firearm once the locking device is affixed to the firearm; and a rear end;

c. a guide pin attached to the lock body and having a portion that lies within the helical guide groove proximate the rear end of the lock body;

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d. a lock key configured to engage the fore end of the lock plunger, wherein when the lock key is used to engage and rotate the plunger, the helical guide groove tracks along the guide pin, moving the plunger between an actuated position, wherein the plunger extends partially beyond the lock body, and a retracted position.

19. The integral locking device of Claim 18 wherein the fore end of the lock plunger is provided with a polygon-shaped recess having a central pedestal.

20. The integral locking device of Claim 18 wherein the lock body is dimensioned to be substantially flush mounted with the outer surface of a firearm receiver, and the lock body has a thickness that is substantially the same as a thickness of the firearm receiver.

5 21. The integral locking device of Claim 20 wherein the fore end of the lock plunger is provided with a polygon-shaped recess having a central pedestal.

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